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EXAMINER

HENN, TIMOTHY J

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 05/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/496,364

Applicant(s)

NETER, SARIT

Examiner

Timothy J Henn

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 2/20/04
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 34 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 and 30-33 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2,3,4</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of invention 1, species 1 in Paper No. 8 is acknowledged. The traversal is on the ground(s) that the "field of search must necessarily cover both species". This is not found persuasive because the non-elected invention/species contain features which would not be included in a class/subclass search or text search for the elected invention/species.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 34 and 35 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention/species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 8.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 16-18 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 16-18 recites the limitation "the programmable gain amplifiers" in line 1 of each claim. There is insufficient antecedent basis for this limitation in the claim.

Accordingly, for the purposes of art rejection, the limitation will be read as "amplifiers".

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2, 4, 6-8, 10 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Uneo (US 6,496,224).

**[claim 1]**

8. In regard to claim 1, note that Uneo discloses a flexible pixel sensor element control system configured to readout and process analog values from a plurality of pixel sensor elements (Figure 4), the system comprising an array of pixel sensor elements (Figure 4, Item 11); and a readout and processing circuit (Figure 4, Items 12, 13 15 and 16) configured to readout and process a plurality of analog values associated with a plurality of pixel sensor element within the array, the readout and processing circuit being configured to readout and process the analog values in a first mode and in a second mode (Column 2, Lines 36-49).

**[claim 2]**

9. In regard to claim 2, note that Uneo discloses a readout and processing circuit which is adapted to read a plurality of pixel sensor elements in parallel (Figure 4, Item 13; The office notes that VCCDs such as item 13 readout signals in parallel).

**[claim 4]**

10. In regard to claim ~~3~~<sup>4</sup>, note that the pixel sensor elements of Uneo form a portion of a charge coupled device (Figure 4).

**[claim 6]**

11. In regard to claim ~~5~~<sup>6</sup>, note that the pixel sensor elements of Uneo are organized in a rectangular matrix (Figure 4).

**[claim 7]**

12. In regard to claim 7, note that the first mode of Uneo comprises a full resolution readout mode (Column 2, Lines 36-40).

**[claim 8]**

13. In regard to claim 8, note that the first mode of Uneo comprises a sub-sampling readout mode (Column 2, Lines 40-43).

**[claim 10]**

14. In regard to claim 10, note that Uneo further discloses a color filter overlaying at least a portion of the pixel sensor elements (Column 6, Lines 57-61).

**[claim 26]**

15. In regard to claim 26, note that Uneo further discloses a camera coupled to the readout and processing circuit (Column 1, Lines 10-15).

**[claim 32]**

16. In regard to claim 32, note that Uneo discloses a method of processing in parallel a plurality of pixel sensor elements, the method comprising: exposing an array of pixel sensor elements to light (Column 4, Lines 14-19); selecting a plurality of pixel sensor elements (Column 4, Lines 25-29); and reading in parallel a plurality of analog values associated with the plurality of pixel sensor elements (Column 4, Lines 20-24; The office notes that the VCCDs readout the pixel values in parallel to the HCCD).

17. Claims 27 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Wober et al. (US 5,475,769).

**[claim 27]**

18. In regard to claim 27, note that Wober et al. discloses a flexible pixel sensor element control system that processes a plurality of pixel sensor elements, the system comprising: an array of pixel sensor elements (Figure 1); and a control circuit, wherein the control circuit reads out and averages a first analog value readout from a pixel sensor element of a first color with a second analog value readout from a pixel sensor element of a second color to produce an average readout value (e.g. Figure 2; Column 4, Lines 4-30; The office notes that Wober et al. completes a weighted average determined by the coefficients C).

**[claim 29]**

19. In regard to claim 29 it is noted that the output of the imaging array is connected directly to the interpolation circuit (Figure 6), therefore the averaging process will inherently be done "on-the-fly".

20. Claim 33 is rejected under 35 U.S.C. 102(b) as being anticipated by Kemeny et al. (IEEE).

**[claim 33]**

21. In regard to claim 33, note that Kemeny et al. discloses a method of averaging two or more pixel sensor elements, the method comprising: exposing an array of pixel sensor elements to light (The office notes that image sensors are inherently exposed to light in order to obtain image signal data); selecting a plurality of pixel sensor elements from an array of pixel sensor elements (e.g. Page 576; Column 2); and averaging a first analog value associated with a first pixel sensor element and a second analog value associated with a second pixel sensor element within the array to produce an average readout value (Figure 1; Section II. Design and Operation).

***Claim Rejections - 35 USC § 103***

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uneo (US 6,496,224) in view of Suzuki (US 4,709,259) in further view of Smith (US 5,418,565).

**[claim 3]**

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24. In regard to claim 3, note that Uneo discloses all limitations except the first and second analog line storage units and line averaging controller.

25. Suzuki discloses a first analog line storage unit (Figure 6, Item 180c) which is adapted to store a first line readout (i.e. The red output from the first line) and a second analog line storage unit (Figure 6, Item 180b) which is adapted to store a third line readout (i.e. The green output from the third line), where the readout control circuit combines a second consecutive line readout from the array with the first line readout to form an RGB triplet (Figure 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the readout system of Suzuki with system of Uneo to allow Uneo to form an RGB triplet. It can be seen that Uneo in view of Suzuki does not disclose an averaging process or that a fourth line is combined with the third line to produce a second RGB triplet.

26. Smith discloses averaging color components, including averaging a third line with a fourth line (Figures 6 and 8) to enable the production of a plurality of resolution levels (Column 1, Lines 6-8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the resolution reduction system of Smith with the system of Uneo in view of Suzuki to increase the utility of the device by enabling the production of a plurality of resolution levels.

27. Claims 5, 11-14 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uneo (US 6,496,224).

**[claim 5]**



28. In regard to claim 5, note that Uneo discloses all limitations except for pixel sensor elements which form a portion of a CMOS device. However, it is well known in the art to create imaging devices, such as APS devices, using CMOS processes to allow for easy integration with other system components (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CMOS device instead of the CCD device of Uneo to allow easy integration with system components.

**[claim 11]**

29. In regard to claim 11, note that Uneo discloses all limitations except a color filter which includes the colors of red, blue and green in a predefined pattern. However, it is well known in the art to use the primary colors of red, blue and green as color filter components arranged in a predefined pattern to effective take full color pictures (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use red, blue and green as the color filters of Uneo to take full color pictures.

**[claim 12]**

30. In regard to claim 12, note that Uneo discloses all limitations except a color filter which includes the colors of red, blue and green in a predefined pattern. However, it is well known in the art to use the secondary colors of yellow, cyan and magenta as color filter components arranged in a predefined pattern to effective take full color pictures (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use yellow, cyan and magenta as the color filters

of Uneo to take full color pictures.

**[claim 13]**

31. In regard to claim 13, note that Uneo discloses all limitations except a color filter which comprises a Bayer color pattern. However, it is well known in the art to use Bayer color filters to increase the resolution of the luminance component of the color signal (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a Bayer color filter pattern to increase the resolution of the luminance component of the color signal.

**[claim 14]**

32. In regard to claim 14, note that Uneo discloses all limitations except for a micro-lens layer. However, the use of micro-lens layers on image sensors is well known in the art to increase photosensitivity of the image sensor arrays (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a micro-lens layer with the imaging system of Wada et al. to increase photosensitivity.

**[claim 23]**

33. In regard to claim 23, note that Uneo discloses all limitations except a television coupled to the readout and processing circuit. However, it is well known in the art to couple televisions to readout and processing circuits of imaging devices to provide a user display to view the scene which the imaging device is currently aimed at (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to couple a television to the readout and processing circuit

of Uneo to provide a display to view the scene which the imaging device is currently aimed at.

**[claim 24]**

34. In regard to claim 24, note that Uneo discloses all limitations except a personal computer coupled to the readout and processing circuit. However, it is well known in the art to couple a personal computer to the readout and processing circuits of imaging devices to allow the outputted signals to be stored for later use on a recording device such as a magnetic hard drive (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to couple the readout and processing circuit of Uneo to a personal computer to save the outputted signals.

**[claim 25]**

35. In regard to claim 25, note that Uneo discloses all limitations except a display coupled to the readout and processing circuit. However, it is well known in the art to couple displays to readout and processing circuits of imaging devices to provide a user display to view the scene which the imaging device is currently aimed at (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to couple a television to the readout and processing circuit of Uneo to provide a display to view the scene which the imaging device is currently aimed at.

36. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uneo (US 6,496,224) in view of Roberts (US 5,541,654).

**[claim 9]**

37. In regard to claim 9, note that Uneo discloses all limitations except for a window readout mode.

38. However, window readout modes are known in the art to increase the frame rate of reading out specific areas of interest on an image array, for example see Roberts (Column 10, Lines 9-21). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a window readout mode in the image sensor of Uneo to increase the frame rate.

39. Claims 15, 16 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uneo (US 6,496,224) in view of Boisvert et al. (US 5,329,312).

**[claim 15]**

40. In regard to claim 15, note that Uneo discloses all limitations except for amplifiers adapted to amplify the analog values readout and processed by the readout and processing circuit.

41. Boisvert et al. teaches the use of amplifiers as analog signal processors for completing signal processing such as white balance to improve image quality (Figure 2; Column 5, Lines 6-39). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use amplifiers as taught by Boisvert et al. to further process the signals readout by Uneo to achieve white balancing and improve

image quality.

**[claim 16]**

42. In regard to claim 16, note that amplifiers of Boisvert et al. are implemented as a separate stage (Figure 1).

**[claim 19]**

43. In regard to claim 19, note that the Boisvert et al. discloses a first gain amplifier amplifying a first analog color component a first amount and a second amplifier amplifying a second analog color component a second amount (Figure 1), wherein the first and second color components being readout by the readout and processing circuit of Uneo (as in inherent under the combination of Uneo in view of Boisvert et al.).

**[claim 20]**

44. In regard to claim 20, note that Boisvert et al. further discloses amplifiers which are programmable gain amplifiers (Figure 2) adapted to be adjusted by a controller (The office notes that the gain of the amplifiers is set by the input to a terminal (Figure 2, Item 110), which would inherently be set by a controller of some kind).

**[claim 21]**

45. In regard to claim 21, note that Boisvert et al. discloses a first gain amplifier providing a first transfer function (i.e. gain) for the first color component and the second gain amplifier providing a second transfer function (i.e. gain) for the second color component (Column 5, Lines 6-39).

46. Claims 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uneo (US 6,496,224) in view of McDaniel et al. (US 4,996,413).

**[claim 15]**

47. In regard to claim 15, note that Uneo discloses all limitations except for amplifiers adapted to amplify the analog values readout and processed by the readout and processing circuit.

48. McDaniel et al. teaches the use of an amplifier (Figure 5, Item 78) to sum data from a plurality of pixels in order to achieve a reduction in the amount of data readout from the imaging device when high resolutions are not needed (Column 2, Lines 42-44). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the system of McDaniel et al. to reduce the amount of data readout from the imaging device of Uneo when high resolution is not needed.

**[claim 22]**

49. In regard to claim 22, note that the amplifier of McDaniel (Figure 5, Item 78) is a summing amplifier which adds data from two or more pixels.

50. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uneo (US 6,496,224) in view of Boisvert et al. (US 5,329,312) as applied to claim 15 above, and in further view of Zhou et al. (IEEE).

**[claims 17 and 18]**

51. In regard to claims <sup>17</sup>~~9~~ and <sup>18</sup>~~10~~ it can be seen that Uneo in view of Boisvert et al. disclose all limitations except for programmable gain amplifiers contained within the

pixel circuitry and within a plurality of column buffers. However, such a system is well known in the art, (for example see Zhou, Figures 1 and 2) as a way to reduce the overall size of imaging systems. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to alter the design of Uneo in view of Boisvert et al. with the gain amplifiers of Zhou contained in the pixel circuitry of the array in a plurality of column buffers to reduce the overall size.

52. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wober et al. (US 5,475,769).

**[claim 28]**

53. In regard to claim 28, it is noted that Wober et al. discloses all limitations except for a parallel readout from the pixel sensor array. However, it is well known in the art to readout pixel elements in a parallel fashion to increase the readout speed versus serial (i.e. when a single pixel is readout from the array at a time) readout (Official Notice). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a parallel readout with the imaging device of Wober et al. to increase readout speed.

54. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wober et al. (US 5,475,769) in view of Boisvert et al. (US 5,329,312).

**[claim 31]**

In regard to claim 31, note that Wober et al. discloses all limitations except for gain amplifiers which amplify the average readout value. Boisvert et al. teaches the use of amplifiers as analog signal processors for completing signal processing such as white balance to improve image quality (Figure 2; Column 5, Lines 6-39). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use amplifiers as taught by Boisvert et al. to further process the averaged signals of Wober et al. to achieve white balancing and improve image quality.

#### ***Allowable Subject Matter***

55. Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### **[claim 29]**

56. In regard to claim 29, the prior art does not teach or fairly suggest the averaging of first and second lines to produce a first RGB triplet and third and fourth lines to produce a second RGB triplet in which pixels of a first color and pixels of a second color are averaged together.

#### ***Conclusion***

57. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J Henn whose telephone number is (703) 305-




8327. The examiner can normally be reached on M-F 7:30 AM - 5:00 PM, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R Garber can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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4/29/2004

  
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PRIMARY EXAMINER

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